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Edited by JOHN BARTLETT.

THE IDEAL-COLOR SENSITIVE PLATE.

MANY writers on the subject of orthochromatic photography have assumed that a photographic plate which would give a correct-color-value photograph of the spectrum, would give the most correct results in photographing objects by reflected light. I long ago pointed out that this is a mistake, but I believe the fact has not yet been recognized by anybody else.

The demonstration is simple enough. A collodion emulsion chlorophyl plate which is three or four times more sensitive to the red and green of the prismatic spectrum than to the yellow, will invariably photograph bright yellow objects lighter than either red or green ones. In fact, I do not hesitate to assert that if we could sensitize the plates for two colors only, red and green sensitiveness would be far more useful than either red and yellow or yellow and green sensitiveness.

The reason is not far to seek. All objects which appear bright yellow to the eye, freely reflect both the red and the green rays of the spectrum, and may be correctly photographed on a suitable plate through a screen which cuts off every ray of true spectrum yellow. The green and red objects will photograph darker than the yellow, as they should, because the green object does not reflect the red light, and the red object does not reflect the green light.

This observation suggests also the reason why blue objects invariably photograph many times lighter than yellow ones on some plates that are more sensitive to spectrum yellow than to spectrum blue; the blue object reflects not only the blue rays, but, in many cases, nearly all the rays of the spectrum from dark green to extreme ultra-violet, and will still photograph lighter than yellow objects on a commercial orthochromatic plate when every ray of the true spectrum, blue is cut off, provided that the violet and ultra-violet rays are not cut off at the same time. Deep red objects, on the other hand, reflect chiefly the red rays, and can be successfully photographed only by the action of those rays.

It is therefore evident that the ideal color-sensitive plate would be at least as sensitive to the red and green of the prismatic spectrum as to the yellow, and that the sensitiveness would fall off rapidly in the blue, and end in the extreme violet.

F. E. IVES.

PICTURES BY PHOTOGRAPHY.

PHOTOGRAPHERS are apt to think that a knowledge of the principles of perspective is a refinement in their art, honored as well in the breach as in the observance. They rely wholly upon the lens, having implicit confidence in the mathematical accuracy of its delineation. But let them stop a moment to consider, and they shall be convinced that pictorial perspective, after all, is not a result of mere lines and angles, but "painter's best art." The pleasure the eye has in beholding the assemblage of objects in nature is due in a great measure to perspective. It gives a variety and contrast to things which are in themselves regular, and confers regularity upon irregular forms, making the composition of the picture harmonious.

Grouping is really a universal law of nature formulated by art, and not a mere product of arbitrary principles founded on certain æsthetic laws. Nature pleases the eye in the disposal of objects, by the subordination of many to one,—giving unity in variety, and co-ordinating the various forms of things. The eye must become trained to an appreciation of the beauty of composition, but the pleasure is not a whit lessened because science has discovered the constant principle upon which nature works.

The times before the discovery of the laws of perspective furnish examples of beautiful combination of lines and forms, which stand a ratherr rigid analysis; but then such works are from the brushes of the great painters only, and merely prove the accuracy of their acquired powers of observation of nature: while the same times abundantly supply most glaring examples of paintings whose beauty is marred by the utter disregard, or, rather, ignorance of perspective. It was only after the true principle of grouping with reference to background had been discovered, that we find the full development of composition. Even the great Raphael sometimes sinned wilfully against the law in his cartoons in giving to the architecture such diminutive proportions with relation to the figures; while Titian ennobled his grand works by his adherence to nature's truth and truth's perspective.

Nowadays, not even a tenth-class painter would dare exhibit a picture showing a disregard of the principles of perspective; and yet photographers are not sufficiently mindful of its importance,—we have seen woful examples at our exhibitions of its misapplication, the result, no doubt, of the presumption of the photographer that his lens cannot lie, since he has the certificate of the manufacturer setting forth its virtues. The certificate may be perfectly valid, and the lens in no way responsible for the stupidity and ignorance of the *soi-disant* artist. The misapplication of an instrument is like trying to gather figs from thistles.

Lenses of very short foci make things appear of an exaggerated size, which are relatively quite small,—mountains of molehills; so it is well the photographer should understand lenses, or better, should know something at least about artistic perspective. He will know that the scene upon the ground glass is ridiculous, and need not wait for his optical friends to point out the misapplication of the lens. The perspective of the lens, however peculiar, supposing the camera to be properly placed, must be in accordance with mathematical principles, and therefore true; but its accuracy does not justify the photographer in making use of it. But this whole subject of perspective, so interesting and important, is to be treated by Dr. Wallace in several papers contributed to the AMERICAN JOURNAL, the first of which is to

appear in the present number; and we would rather this paper should be a mere introduction to the scientific treatment the subject will receive from his pen. The topic was called to our mind by the pleasure we recently had in studying a number of beautiful pictures kindly sent us by Mr. Frank M. Sutcliffe, of Whitby, Yorkshire, England, a few of which we have reproduced for the pleasure of our readers. The accurate acknowledge of perspective which Mr. Sutcliffe displays in the composition shows the skill and taste of the cultured artist. Misapplied perspective is more apparent when figures are introduced in the picture. The untrained eye may think their position and relative size correct; but unless one have an intuitive or acquired power of verifying the dimensions, one will go on repeating errors, until some kind friend takes the foggy film from his eyes, and he beholds them in their enormity, and pales with mortification or blushes with shame.

Figures in landscapes are the life of the composition in more sense, than one; but, we beseech you, keep them out unless you know how to put them in. Even though you have a good long focus lens, or one of the high-priced kind which is not so long focus, yet has all the virtues and more than a simple long focus one,—you will make your picture look most queer, by the height of figures above or below the horizon line. With the same figure at the same distance you may raise or lower the landscape in vertical height. In the one case Gulliver is in Brobdingnag, in the other he is translated to Lilliput.

The height of the horizon depends upon the elevation of the tripod,—we generally place the camera too high, and bring the horizon up to the neck of the figure. Artists seek a lower level; they make their sketches seated, while photographers stand up. But we "came to praise Cæsar, not to bury him" in our dissertation. Dr. Wallace, no doubt, will touch upon the means of securing proper perspective; we desire here merely to tell how beautifully Mr. Sutcliffe has managed the relation of his figures to his background; how the position occupied by them tells in a charming and naïve manner the story. He seems to have caught them unawares; they are wholly unconscious that they are contributing so much to our pleasure.

The two sides of a landscape should never balance; there should be a small and a large mass, and generally the interest should center in the small mass, but it must also radiate its influence into the large one. How admirable Mr. Sutcliffe has carried out this principle. There is never a divorce of the interest of the two principal masses in his picture; the connecting link is generally some human motive, which gives an added charm to his delightful productions.

A scene evenly lighted all over is never as effective as one in which the highest light is concentrated at a single point. True, it is not possible always to get such subjects from nature; yet the appreciation of them when they do present themselves is an evidence of a feeling for poetic art. Mr. Sutcliffe does not fear to risk pointing his camera towards the light; so that he secures the beautiful effects. The play of light upon the water; the graceful and varied forms of the vessels, together with the reflections and the strong effect of dark against light, are managed with marvelous skill. We think Mr. Sutcliffe has produced some of the most beautiful results of this kind in photography.

There are three things to be considered before we set about the utilization of de-

tail in composition; the management of the foreground, the middle distance, and the extreme distance. The first gives force to the scene, the second variety, and the third sentiment, or rather poetry. Leave out the foreground, or unduly slight it, the picture is weak. There is no place for the eye to start from, to take its delightful excursions over the distant fields. It is best if the eye rest awhile upon foreground detail before its aerial flight. If the extreme distance is omitted from the picture, it gives it too much of a shut-in look,—"cabined, cribbed, confined." Oh, let us have that little peep between the hills, with its hazy softness. We cannot always get this distance in its proper value, but let us never neglect the opportunity when presented. Mr. Sutcliffe has, in his hunger for artistic beauty, greedily seized upon it for our delight.

Our remarks have reference to the whole series of views by Mr. Sutcliffe, displayed at recent exhibitions, as well as to the pictures he has kindly sent us for our personal delight. The prints in our present number are collodion reproductions, but they serve to show some of the characteristics which distinguish the work of this artist, who prefers to use the camera to the brush.

PERSPECTIVE IN PHOTOGRAPHY, AND THE USE OF WIDE-ANGLE LENSES.

OUT of the numbers of men who devote themselves to painting, drawing and etching at the present day, there are probably but few who would not admit that the art of photography had been of use to them in one way or another.

In earlier times, when our art was in its infancy, this was by no means the case; the crude efforts of the camera being so severely criticized by the gentlemen of the brush that it amounted almost to an embargo laid upon photographic pictures, except in rare cases where men were intelligent enough to photograph just the sort of bits and detail useful to the artist. Now-a-days, however, we are glad to see that photography is very generally useful to artists, but we are also sorry that the works of some recent painters and draughtsmen prove them to have gone so far as to imitate some of the most glaring faults seen in photography.

Among the number of characteristic photographic defects that have met with severe criticism, and which are now being copied by painters, is exaggerated and violent perspective, and this has become very much more prominent ever since the introduction of wide-angle lenses, by which we mean those including an angle of, say, 80°.

It has often been urged that a study of perspective was of the greatest importance to the photographer, but the very ones who have made the loudest outcry about it have proved themselves singularly incapable of teaching such principles of perspective as could be of the slightest use to the practical photographer. Mechanical drawing to scale and the regular drill required of any painter or sketcher will, of course, train their eyes to a great degree of acumen in the observation and criticism of pictures, but draughtsmen have to work to obtain this acumen in a manner that would not generally be found useful by the photographer. And why? Simply because the perspective in a photograph is made by the lens, and is therefore unalter-

able. Again, supposing the camera to be properly leveled, the perspective of the photograph, no matter how violent it may appear, is always mathematically correct. Now, it is just this unrelenting exactitude and mathematical precision that often constitutes the defect in the photograph, and which, when *properly falsified* on the canvas by a man of skill, is one of the numerous factors which contribute toward the elevating of his work to the dignity of art. Penley speaks as follows: "An accurate knowledge of the principles of linear perspective is as necessary in drawing as that of grammar is in the philosophy of language. By it we are taught the proper adaptation of every line in expressing with truthfulness the parts and proportions of every object that recedes; and hence, without its application the most beautifully wrought and the most carefully executed picture in other respects would be little else than an assemblage of painful and complicated errors."

This is all very true, but we will only remark that just as thousands of persons can speak a language without a knowledge of the rules of grammar or the "philosophy of language," so can many skilful draughtsmen make good pictures with their hands without knowing the theoretical laws of perspective; and if the artist can do without a knowledge of these complicated laws, how much more can the photographer whose pictures are, in almost every case, mathematically accurate.

It will be understood that we are speaking of the *theoretical* part of the doctrine of perspective as being of little or no use to the photographer, as well as of the numerous details and principles which must be mastered before a drawing can be correctly made by hand. But there are ways in which a good deal may be done by the photographer in practically applying the principles of perspective without his being aware of it, so to speak.

Let us suppose that we are seated at the end of a long table, at the other end of which is a box with its bottom facing us. We note carefully how much of the four interior sides of the box are visible in proportion to its bottom. Having a clear idea of this, we now bring the box up to within a short distance (say 18 inches) of our eyes, and we immediately see that the interior sides now appear much broader in proportion to their height and to the bottom of the box than they did when the distance was greater, and that the lines of junction of each side with its fellow appear to recede at much more obtuse angles. Simple and almost self-evident as these facts are, they are none the less very useful, when we consider that the principles involved are essentially the same as in the photographing of street views in perspective, and many other subjects. For if the camera be supplied with a wide-angle lens, the effect in the photograph will be, in a general way, much the same as the appearance of the box when brought close up to the eye of the observer. All straight receding lines, such as curb-stones, rails of car-tracks, and cornices of rows of buildings will run at far more obtuse angles than when a lens including less subject is employed, in which latter case things correspond to the view of the box as seen at the far end of the long table.

The obtuseness of angle of the receding lines in the case of the wide-angle lens brings with it the disagreeable feature that all objects comparatively near to the camera appear disproportionately larger, while distant objects, of course, appear correspondingly dwarfed in size. But this is, nevertheless, a perfectly accurate condition of affairs in the photographic representation of the view, as might be proved by mak-

ing a drawing in perspective from the same point where the camera was placed and *including in it the same amount of subject.*

Reasoning of this character will force itself upon those who deal much with architectural photography, for it is just in this class of photographic work that the necessity for wide-angle lenses is most urgent, and in which, at the same time, the greatest caution must be observed. The trouble here is that the wide-angle lens being used, as a rule, in cramped situations, will produce the effects just described; or, in other words, will be like the eye of an observer straining to see the whole of an object that has been brought up to within a few inches of his face. Nor are landscapes and architectural photography the only departments of the art that may be made to suffer in this manner. Portraiture can be absolutely turned into an art of caricature by the injudicious use of the wider-angle lenses worked at short distances from the sitter. All practical portrait photographers know that the lap and feet of the sitter will appear relatively larger the nearer the lens is placed; the same is true of the hands, and the gawkiness with which a country bumpkin obtrudes his feet and hands may be, and often is, increased to a very laughable degree by the use of wide-angle, short-focus lenses brought close up, owing to want of space in the gallery. The same sort of thing is often seen in early amateur attempts at portraiture in small rooms, with small and short focus lenses. Now, a few trials made with the lens at varying distances from the sitter's head will show that when the former is too near, the cheeks will appear too narrow and contracted in proportion to the length of the face, but if the apparatus be removed to a greater distance, the whole head or figure will appear more rotund and full. Thus, a person lank and spare in figure will be made to appear more so if the camera be brought too close; while, of course, the contrary is just as true, namely, that a stout person may be made to appear still more stout by removing the camera as far as possible, and using a long-focus lens to compensate for the greater distance. Thus, we may set it down as an axiom that things look broader when taken near at hand.

Readers of the photographic journals will remember to have often seen the assertion that the finished print should be viewed at a distance from the eye equal to the focus of the lens used in making the negative. This may be true, but it is quite impossible to do so in many instances, and it would be far more to the point to say that objects which are generally regarded from fixed distances should be *photographed from those distances* whenever possible. Such things as are held in the hand to be looked at, for example, and all the multitudinous curios and miscellaneous matter preserved in cases in museums, etc., could be photographed from about the same distance as they are viewed from; care, of course, being taken to select a lens of the proper focal length. Landscapes could not be ranked in this category.

A proof of what we say may easily be had if some such article as an ornamental epergne be photographed at about the distance it would be seen from when exhibited in a shop window, and the negative compared with one made, say, from a distance of eighteen inches, with a lens of wide enough angle to include the whole (if, indeed, this were at all possible.) The latter negative might be compared to the image formed in the eye of an intending purchaser of the ornamental epergne, who was examining the detail of the work from as near a point as the focus of his eyes permitted.

ELLERSLIE WALLACE.

(*To be continued.*)

WE have received the following letter from Mr. V. Schumann, of Leipzig, Germany, in reply to our remarks on Mr. Ives' recent improvements in orthochromatic photography, puplished in the July number of the AMERICAN JOURNAL OF PHOTOGRAPHY.

We translate the letter at the request of Mr. Schumann, but feel especially pleased to give our readers its contents coming from one whose labors, like those of Mr. Ives, have greatly advanced our knowledge in orthochromatic photography. The letter contains some valuable hints which will be read with interest.

(*Translation.*)

No. 25 Mittle Strasse, Leipzig, August, 1888.

ESTEEMED GENTLEMEN:

The article entitled "*A Perfect Orthochromatic Plate*," on page 181 of your excellent AMERICAN JOURNAL OF PHOTOGRAPHY has prompted me to make the following response.

I would ask you to kindly favor me by publishing the same in your Journal, and in expectation of the fulfilment of my desire, allow me to express in advance my sincere thanks to you.

I am yours very truly,

V. SCHUMANN,

Engineer and Technical Director of the machine works of A. Hogenforst, Leipzig, Germany.

CONCERNING THE COLOR-SENSITIVENESS OF CYANIN-BATH-PLATES.

ON pages 181 and 182 of your AMERICAN JOURNAL OF PHOTOGRAPHY, in the article entitled "A Perfect Orthochromatic Plate," I find mention made of my experiments with cyanin in orthochromatic photography, and a comparison of my method of sensitizing with that of Mr. Fred. E. Ives. A diagram is given with the article for the better understanding of the relations of the curves of sensitiveness of the spectra under consideration. The first of these curves belongs to the bath process; the last to that recommended by Mr. Ives in the article. I am thoroughly competent to judge of the characteristics of the various methods of plate coloring treated by me, although I do not think it necessary here to refer to them.

If now Mr. Ives has not obtained any better orthochromatic results than that indicated by the curve in the diagram he gives with plates bathed in cyanin solution, according to my formula, I cannot but naturally conclude that extraordinary circumstances have retarded the sensitiveness for yellow and red in a most striking degree.

According to the results indicated in my negatives at hand, and indeed according to my very numerous and manifold spectral negatives, the maxima in the yellow and red of the sun's spectrum attain nearly, if not quite, to the height of the maximum for the blue. My curve of sensitiveness is exactly the same as that of Mr. Ives upon all those plates which were prepared by me in accordance with the demands for color sensitiveness. So slight a degree of excitability for yellow and red as that obtained by Mr. Ives, working, as he says, by my formula, was never manifested.

The properties of the sunlight fluctuate very materially, even in the case of apparently white sun disk; the waves may be of different lengths, at different times may show varying energy, and no spectral region is subject to so considerable variation as that of the yellow and red. The absorption which the earth's atmosphere exercises upon these rays is too considerable to be passed by without a trace upon the all-perceiving retina of the light sensitive plate of the spectrograph. But despite this variation in luminous intensity, I have never in any of my spectrum photographs, either in winter or in summer, obtained so slight an effect in yellow and red sensitiveness as obtained by Mr. Ives upon his plates. The results obtained by Mr. Ives' cyanin bath plates I obtained with films colored in the emulsion. If I add to my emulsion, shortly before pouring, some alcoholic solution of cyanin, then, to be sure, the plate prepared with it remains in yellow and red sensitiveness far behind the blue and indigo, and such plates are in fact of far less orthochromatic value than those sensitised in the cyanin bath.

The difference in the action of cyanin in respect to the method employed in sensitising I pointed out years ago; indeed, I was the first to call attention to the fact. I cannot, therefore, give Mr. Ives right when he publishes in your Journal the spectrum curves, and declares that cyanin applied according to his method gives far more sensitive plates than those prepared by my bath process. My bath process has been objected to on account of alleged uncertainty, but I have never experienced any uncertainty, although I have tried hundreds of plates prepared according to its formula.

When other experimenters complain of variation in sensitiveness, the cause may perhaps be traced to excess in bathing the plates. The character of the emulsion also exercises a very considerable influence upon the orthochromatic value of the cyanin plates: for instance, alum in the gelatine emulsion destroys the effect of the color material. Iodide of silver in excess represses the yellow and the red sensitiveness greatly, but at the same time heightens the action of the blue sensitiveness. The addition of other substances to the emulsion will likewise injure the orthochromatic value of the plates. If it is desired to secure the full advantage of cyanin as a red sensitiser, only those plates can be used for bathing which are prepared from emulsions of pure silver-bromide gelatine. With few exceptions, I have made my own emulsions for experimenting with cyanin.

Notwithstanding the excellence of the plates in commerce, I would not like to trust them in delicate photometric experiments, and for this reason would not recommend them, because the success of many experiments frequently depends upon the composition of the sensitive film and its further treatment. It is hardly a good plan to employ any one plate in every possible scientific experiment, even though it possesses all the most excellent qualities combined, which would make it suitable for practical photographic work. The case is the same with reference to optical or color sensitisers.

Mr. Ives thinks that my cyanin-bath is not suitable for very sensitive gelatine plates. I shall here say that the most sensitive film can be used, provided only the bath is so far diluted that the formation of fog and specks is rendered impossible. I have in this manner prepared plates, still very sensitive to red and yellow, but I will admit that in such cases the blue sensitiveness was in excess. The photo-

graphic maxima in red and yellow fall lower in such plates than the maximum of the blue. For securing the highest orthochromatic effects, I recommend, therefore, in the case of cyanin, to use even now-a-days only plates of moderate sensitiveness. I have, with such plates, obtained the best results in exposures upon objects colored red.

I would like on this occasion to call attention to the difference of the results obtained according to the method of color sensitising pursued. When the coloring matter is added to the emulsion, the plates prepared therefrom give intense and brilliant negatives; while plates bathed in a cyanin solution work uncommonly soft, the negative not being characterized by great contrast—having greater uniformity in the light and shade; consequently, the former method (colored emulsion) is more suitable for photographs demanding a great sharpness of detail,—a quality required, for instance, in spectrum photography. The latter method (where the plate is dipped in the coloring matter), on the contrary, is more suitable for the photography of colored objects, in which the reproduction of relative tones of color is demanded above all other considerations. It is quite surprising how, even plates which work intense, are changed by being subjected to a cyanin bath.

Nothing better demonstrates this than the results obtained by photographing the spectrum upon two halves of the same plate; one of which has been bathed, the other not. On the cyanin-bathed half, the spectral lines are represented too delicate and pale, while on the plain plate (mother emulsion), the greater number of lines come out in bold distinctness. This diminution of the intensity is a peculiarity which is special in a high degree to cyanin; at least, I have not met in my experimentations with any other of the many sensitisers which are superior to it in this respect.

V. SCHUMANN.

MR. IVES'S REPLY.

BY courtesy of the editor, I am permitted to say a word in reply to Mr. Schumann in this issue. It is perfectly true that Schumann's method, with both ammonia in solution and a preliminary soaking in ammonia, will give almost as striking results with some plates as my own method. My experiments were all conducted with the most rapid commercial plates I could find, and those treated with the cyanin bath were not previously soaked in ammonia (I did not specify Schumann's method), because it has been repeatedly asserted that such rapid plates would not bear that treatment. Although I have in no case obtained as good results with Schumann's method as with my own, I have no doubt that such results may have been obtained with that method on pure bromide of silver plates. The commercial plates which I employed contain some iodide of silver. The facts which I wish especially to emphasize are as follows: 1st. My method, giving results which have certainly never been surpassed, and which is perfectly successful with the most rapid commercial plates, is far simpler and more convenient to employ than Schumann's. 2d. The sensitizing action takes place perfectly when only cyanin and water are present, instead of cyanin, water, alcohol and ammonia, as in Schumann's method. 3d. I employ only one stock solution, which can be made in a minute, and keeps indefinitely (in the dark); Schumann makes up a bath of various ingredients, in definite proportions, for each plate or batch of plates to be prepared.

F. E. IVES.

FULL SIZE PIN-HOLE CAMERA.

THE possibilities of the pin-hole camera are worthy of consideration. When properly constructed, it is said to work well up to 12 inches distance from the pin-hole, and at the remarkable wide angle of 120 degrees. Making a diagram, I find that an angle of 120 degrees will at 12 inches distance cover a circle of 41 inches diameter. Of course, then, a 12-inch pin-hole camera can take a circular view 41 inches across; a square view as large as a square inscribed within a circle of 41 inches diameter, and vertical or horizontal oblong square views as large as will go inside of a circle 41 inches across. Smaller views of any shape can, of course, be taken.

With a full size pin-hole camera, what is to hinder from taking direct camera views as large as are usually required, and without the usual bother and cost of first taking a negative, then enlarging this as another negative, and then printing,—and all, perhaps, to make a single copy?

A sufficiently large camera and some quick process for obtaining camera positives instead of negatives is all that is required.

Of course, all pin-hole camera views will be reversed, but this objection is of little weight compared with the satisfaction of obtaining large views at a single operation. Besides, with the same camera and the same process for obtaining positive views, one may take a copy of the reversed view—or as many copies as wanted, whether of same size or smaller,—and such copies will not be reversed. And this would seem to be less trouble and expense than the usual method of taking, *enlarging and printing*.

I should think some photo supply house might make it pay to get up a full grown pin-hole camera and outfit—the camera to be as large as it can be and still do good work—and at a cheap, popular price.

W. L. DAVIS.

PHOTOGRAPHY AND PAINTING COMPARED.

IN the last number of the AMERICAN JOURNAL, the remark is made that "nothing in the whole range of art is perhaps so difficult to depict in their true relations as the sea and sky," etc., and further that photography has taught us more of the sea's phases than centuries of untiring observations. Now, I beg leave to think that painting often more faithfully represents the true relations of light and shade than photography, however much the latter may possess the power of accurate delineation. A painting gives the impression of nature by lowering the key in which are represented the relations of light and shade, while the photograph often gives a false impression by registering the greys as white, and the shaded water as black.

Photography in its highest perfection is a chemical result controlled by an artistic judgment. A painting is also composed of chemicals, but the chemistry is not determined by mechanism, but is entirely under the control of the artist. The technical execution of a photograph may be perfect, and yet the photograph have no artistic value; or it may be artistic without technical perfection. A painting may also be faulty in technique, but in its motive, its composition and harmony of color all that can be desired.

The great advantage an artist has over a photographer is that he can husband his resources. The light of nature is in a far higher key than any painting or photograph can render. The highest light the artist possesses is white lead, which is darker than snow, even in shadow. A prominent artist held his white cuff in shadow against the ripples on a mountain stream, and their silver gray color was far lighter than the white cuff. The artist can and must lower the key of his whole picture; the photographer is dependent on the actinic power of light. The painting may be correct in color and chiaroscuro, but the photograph will generally render the gray ripples in white, and the shaded water in black—producing a staring contrast. Take another instance, given by Hamerton. A crowd of people stand on a pier looking at the sea. The sparkling ocean is rendered with splendid effect, but the crowd on the pier is black against the sea. Give a longer exposure and the pier becomes clearer, but the effect on the sea is lost. It is true, much may be accomplished sometimes by careful exposure and development, but the real difficulty is not in want of photographic skill, but is inherent in the materials used.

As a draughtsman the camera is unrivaled. No artist in the world can approach it in accuracy. With a good lens, and the camera plumbed and leveled, every line is given with absolute fidelity.

It is in composition that the photographer most frequently fails. But artists have shown that a photograph, so far as composition is concerned, may be as complete a work of art as a painting. Witness the photographs of H. P. Robinson, an English artist, who, by the use of his camera, has extended his name far beyond the limits reached by his palette and pencil.

WASHINGTON VAN DUSEN.

COMPOSITION.

A Communication to the Birmingham Photographic Society.

THIS evening I propose reading a paper upon "Composition," and with regard to the selection of this subject.

There are present some whom I know to be quite as conversant, if not more so, than myself on this subject, but it was not for them that I purposed giving this paper, and as I know they will gain nothing new from me this evening, I hope they will pardon me if I should prove a little irksome; for be it understood that what I have to say will be in the simplest manner, and as little technicality introduced as possible, my object being *to try and help* the amateur who is about to start or who has only just started. I will likewise take this opportunity of saying that I wish it understood, knowing as I do that this subject has been handled by other members of the Society, I may therefore clash with regard to some of the things they may have said (I hope not); but if I do, remember it is only my opinion, and be it far from me the wish to be antagonistic or opposed to any member of this Society in the course of my paper.

I shall bind, as it were, artist and photographer together, for such ought to be, although I know, and doubtless many of you know, that the artist repudiates photography; he puts photography down as a science, that the camera is a machine; he will

even go so far as to tell you that art work in photography is more or less accident, as a machine cannot have brains. What nonsensical bosh! And this is true, although hardly believable, that any man of common sense could make such a statement; but such, unfortunately, are facts. But worse than that is, that although they condemn it with the greatest condemnation, yet they secretly use it (which is nothing more nor less than dishonesty). Then as to its being a machine without brains. What about the pencil or brush, may I ask? Have they any more brains than a camera? And a photographer has just as much right to make the same statements with regard to the pencil and brush without being considered an idiot. As with an artist so with regard to the camera; but I am glad to say that artists of the present day do admit that brains have to be used with the camera as much, if not more, than with the pencil or brush.

Let us consider for a moment what has been the cause of all this, and I think you will find that at the bottom of it all is simply this,—that when the glass pictures became known, and the illiterate found that they could obtain a camera and lens for a few pounds, and the *modus operandi* was simple, and combining with that an enormous profit could be obtained; and at the same time the teeming thousands of poor artisans, who up to that period had been debarred the luxury of having the slightest memento of any dear friend or relative, rushed with their shillings to the impostors of those days, who palmed upon them the vilest of rubbish. But I am glad to say that this is a matter of the past, and, what is more, will never be revived again, because education has become compulsory, and art is to be introduced, and with its refining influence vulgarity will stand no chance, and the poorest artisan will never be satisfied to spend his money in such rubbish. Now, under such circumstances, how was it possible for photography to be accepted as art, much less as high art? And was it surprising that artists condemned it *in toto*?

Now, having passed through all this, how does photography stand at the present day? Pre-eminently first of all arts as a decorative art; as a pictorial art both as regards portraiture and landscape, and for book illustrating *nothing can touch it.* Annuals again; photographs, especially if they be instantaneous, may be directly copied, and I know for a fact are copied by professional artists, and sent into the market as their own original studies from nature. Good photographs are always instructive, the drawing is so beautifully correct in detail. After turning over many, if they be well selected, it feels almost impossible to look at sketches, except by the very first masters. It is said that a photograph cannot lie; this is certainly not a fact. A representation of nature, to be good, must be true in relative values of light and shade, as well as true in drawing. Now, in the former particular, photographs are very wrong indeed. The clearer the air and brighter the colors the farther from nature they are. For example, a bright orange dress against an intense blue door will look like a dark dress against a pale door. But with all these faults a great service has been done to art by photography. The public are more critical in the matter of character and drawing, and are better able to weed out the bad pictures from the good. At one time artists used to take liberties with nature in a way that would not be permitted for a moment now. The great arch-liberty-taker was Turner. He would put the sun, moon and stars into one sky if it helped his composition, and the reason of his success was his great knowledge of composition.

Now, if two artists choose the same subjects, as frequently happens at well-known places abroad, and both are conscientious workers, it is nevertheless very unlikely that they will produce pictures at all like one another; though both may be equally like nature generally, one will be much better in composition than the other, simply because the artist who did it knew most about composition, and therefore chose his position best. This is even more the case with photography than sketching. We frequently see photographs of places that form the most charming pictures, but more frequently we find them not forming any picture at all, though we all know their subjects to be beautiful. A knowledge of composition is very important, and even a few rules are very useful, although I do not intend to weary you with a lot of bygone and far-fetched notions, as, for instance, points in a picture. There is an old antiquated theory of dividing the picture into a number of points, and one I believe is forty. Imagine dividing a picture into that number of points, and then having to go over all those points and to say this is a weak point, this is a better point, but this one is the best, and so on, etc.

Now as regards the points, all I have to say about them is this, and I think all connected with art (and of course I bring photography under that heading, combining, as I have already stated, artist and photographer) know that the centre of a picture is its weakest point; beyond this, I think, instead of helping, these far-fetched theories only tend to confuse, and often cause beginners to refrain from, and even object to, having anything to do with it, on account of, as they think, the matter being too complicated, and consequently say to themselves, "I shan't trouble about it; but when I see anything that pleases me, shall take it."

Now if there are any present who entertain this idea, allow me to disabuse your mind of such; for although there is a little difficulty, it is not a formidable one, and I will now try to explain the two principal ones, and if I can, for your better understanding, will illustrate the two principles. The most pleasing compositions are those where the masses do not balance each other; but the smallest mass should have the greatest interest. Two of the simplest forms of composition may be seen in an egg laid sideways and illuminated by one point of light. Now, in the first place, let us get the strongest light to fall on the front and a little to one of the sides. This will be the strongest light, and from there everything will graduate into shade; the under surface will be much the darkest, although the extreme edge will begin to fade off again into half light. Now remove the light and place it at the back of the egg; you will find the edges to be the lightest, and the darkest point will be more or less central. This is self-evident, then, that in the first illustration we have the sun in front of the picture or behind the spectator, and the picture produced will be in full daylight: the second is when the sun is behind the picture and in front of the spectator, and represents twilight.

Again, when the composition of the ground is unavoidably one-sided (as in almost any view of Gibraltar, for example), interest must be given, so as to balance the ponderous mass of rock, by means of clouds or figures, or both. The great use of foreground figures is to add an interest to the picture in the right place. A picture or sketch may be composed by lines as well as masses, such as Calais Pier, and many others by Turner. The lines should always be in curves that have a tendency to run to two balancing points. The curves should, if possible, never be a part of a

circle, but be some irregular yet true curves tending towards parts of ellipse to form a good composition; not only the masses combined with interest must balance, but the light should be as much concentrated as possible upon one point and the shadow on another. Therefore my reason for selecting the egg as an example to illustrate this principle. Of course we must not bind ourselves rigidly to anything, for all rules must be a little elastic. Of course when the greatest dark and highest light come in juxtaposition, the strongest effect is produced in a picture, yet this should be got naturally, not artificially. Some of the easiest things for grouping are boats and ships on the sea. The different colors of the sails and hulls permit the lights and darks to be grouped, even when everything is in the full glare of the sun. The play of light on the water, the forms of the waves, if the sea is rough, and the reflections when it is smooth, all lend themselves easily to grouping of the most complicated and delicate kind.

In all composition there should be one chief point of interest. If it is large, there is no limit to the number of subsidiary points of interest, graduating from the principal one down to those that are of very small value. In former times nature never seemed enough for the artist. He always tried to add to it, to make it richer than he found it. Now we know a picture may have all the requirements of a good composition, and yet may be perfectly natural. The great spread of instantaneous photography has made this abundantly plain. If we look over a number of instantaneous photographs we may pick out many that in composition and effect are beautiful pictures; and there is no possibility of contrivance in these as there is when the incidents are arranged for the slower processes of photography. It is curious to notice how the less the figures are aware that they are being taken,—in other words, the more natural the composition is, the more beautiful it often becomes. Not but what there are many more examples of bad than good composition, but where it is good it has a charm about it that is only possessed by the works of the greatest masters.

In conclusion, allow me to refer for a short time on the selection of a subject. It is strange what a long time it takes before the beginner can learn to choose a subject that composes well. Details attract him too much, the surroundings, general form, and curvature of lines are overlooked, and then he is surprised when he develops his plate to see how poor and uninteresting a picture he has got. He should always regard general grouping first, and special interest of detail later. An admirable way of doing this is to half close the eyes, which causes the general grouping of lines and light, shade and color, to become more easily visible on account of the attention not being drawn off by the detail. Sometimes you may have a subject that, to all appearance, would make an excellent picture, yet on careful consideration you find that it does not altogether please you. Supposing it to be a fine bit of heather in full bloom, with perhaps some cottages and fir-trees at a little distance, rather on one side, and distant hills beyond, the cause may be that all the interest is one-sided. Now, this selection may be very good. What is it, then, that is wanting? Why, the carrying of the interest through the picture. "Well," you say, "how is that to be done?" By the introduction of figures. For instance, a man with a donkey and cart, or any rustic figures suitable to the scene. You may say, "Suppose we cannot get the donkey and cart, or the rustic figures?" Well, then, my advice is, don't take

the picture, or, in other words, don't waste a plate; for if you do, depend upon it you will never care for the picture. The French consider a landscape is no picture unless there are three planes or parts. The first plane, or foreground; the second plane, or middle distance; the third plane, or extreme distance. If the third plane be missing, a close and shut-in feeling is produced—a little peep of distance should be got in somehow. If the second plane is not seen the effect is theatrical. If the first plane, or foreground, is omitted all strength goes out of the picture. Lastly, if both the second and third planes are wanting, you have neither landscape nor picture; it is only a study. The advice of a celebrated picture dealer to a young landscape artist was, "Never paint a picture with a shut-in composition. People inside rooms like to have pictures, which, when they look at, they can imagine themselves seeing out of to something bright and fresh beyond." To choose a subject well, you should perpetually think of how it will compose, either with or without the accessories of figures or strong effect. The most interesting photographs are those which depend upon effect or figures for their strength. Figures play so important a part in composition that it would be impossible for me to do justice to myself, or to be of any advantage to you, without devoting another paper to the subject. I therefore thank you, gentlemen, for your kind and patient hearing.

G. S. SERSCHALL.

PHOTOGRAPHS TO BE COPIED.

WE do not think that to many people anything on earth is held dearer than some old photograph devoid of artistic merit, but faithfully portraying the lineaments of some departed dear one. It is of untold value; once lost, nothing could replace it, and there can scarcely be a photographer of any experience who has not, at one time or another, had such a picture brought to him by a sorrowing friend or relative, with tearful entreaties to "be careful with it," and to reproduce it as faithfully as possible. And yet to what risks it is often subjected the bereaved owner little knows. Certain disasters in connection with this kind of work having occurred within the range of our own personal knowledge, we have thought it would be by no means inopportune to draw attention to some of the dangers that may befall such treasured relics, even where every care is taken.

We are too apt to overlook the fact that a generation of photographers has arisen who are absolutely ignorant of all practical acquaintance with the collodion and Daguerreotype processes; they would, perhaps, know an example when they saw it, but that would be all. Of its particular peculiarities, as they had never been brought into contact with one, they would have no knowledge. That this is so with professional photographers is in some cases true, and far more is it with the lady assistants that they, as well as the older hands, necessarily leave so much to. We have had personal cognizance of more than one actually painful incident in this connection, and, as to be forewarned is to be forearmed, we believe we shall be performing a work of real usefulness in thus drawing attention to them. We believe that it would even be wise for every photographer to have a small code of instructions drawn up, calling attention to these matters.

To particularize. The first incident that we have known of occurred, fortunately, after the picture in question had been copied. It was taken to the young lady who had charge, that she might replace it in its case. She brought it to her employer with the remark that "she could not get it clean however she rubbed it." She had been some years at her work, but never before had handled a Daguerreotype, and in this case had rubbed the image completely away, leaving nothing behind but a silvered surface, owing to her urgent sense of cleanliness. We may be sure that that employer took steps to prevent the occurrence of any similar *contretemps*, but first there was one picture less in the world. A Daguerreotype was once brought to us for advising upon, which had been damaged by a skilled photographer accustomed to such work. In removing the glass, preparatory to copying, he found so much difficulty that he inserted the point of his penknife, and prized it away. In so doing the glass broke and injured the delicate surface of the image. Old hand as he was, this gentleman was ignorant of the fact that in some instances, where absolute safety from atmospheric influences was desired, the metal plate and the glass were cemented together by Canada balsam. It was so in this case. To remove the glass would be as difficult almost as splitting a sheet of glass in two.

The stock type of photographs usually taken to be copied, however, undoubtedly consists of the old collodion positive in its various forms—plain photograph; alabastrine photograph; tintype; or glass, colorless or claret color; backed with black varnish or velvet; varnished with a strong hard coating, or with one so slight as to be scarcely a protection, as the alabastrines often were; or not varnished at all; of which last two kinds of picture very many used to be sent out. Now here at once, to the hand unfamiliar with such work, we see pitfall after pitfall spread forth.

We were told once of a case where it was the constant custom of the photographer, when an old positive was brought to him, to remove the black varnish, so as to get a negative that would print non-reversed, the "likeness" invariably being better under such conditions. On one occasion the copying was undertaken by a young operator,—a really clever portraitist, but who had never before been brought into contact with this kind of work. Removing the positive from the case and fittings, he likewise industriously scraped away at the black varnish, just as he had seen his principal do: the result was complete effacement of the portrait. It had been blackened upon the collodion side, and picture, varnish, and all were removed. This operator, doubtlessly, would never do the like again; but some one had to suffer for him to gain experience.

Again, we were referred to, quite recently, to suggest a remedy, if possible, for several glass positives upon which some strange dark marks had made their appearance after copying. A short inspection showed that these positives had, after the manner much adopted by some workers, received a coating of varnish that dried quite matt in the whites, and so was of little protective value against friction. The positives had been put in a frame with velvet backing instead of black varnish, and the fitter had used sufficient pressure, while securing the glass picture tight into its place, to abrade the lights, which then exhibited dark stains. One of these pictures, we shrewdly suspect, had been rubbed before framing, and this might easily be done, and no one be the wiser.

We will conclude our list of disasters by noting an accident that occurred not in

the hands of a photographer (though the incident might equally well have happened to one.) A valuable ivory miniature was sent through the post to a designer of house decorations, to have a sketch for a frame made. The sketch was made, letter of instructions written and copied, and the whole sent by registered letter to the owner. When it was opened the miniature was ruined; it adhered over its whole surface to the tissue paper enclosing it. The explanation was simple: the letter was, when being copied, made damper than usual, the tissue paper received a portion of the moisture, sufficiently so to cause it to soften the gum which is so freely used in miniatures, and, in consequence, all adhered together, and, when dry, refused to separate.

It is thus evident that so simple a matter as the copying of an old, intrinsically valueless photograph, or miniature, is fraught with danger, and in conclusion we cannot but again express our opinion that in view of the possibility of such eventualities, all who consent to undertake such copying should make themselves acquainted with all the peculiarities of their charges; and, above all, should give special instructions concerning them to any, other than themselves, to whose charge they may be temporarily entrusted.—*The British Journal of Photography.*

CLOUD EFFECTS IN PHOTOGRAPHS.

WE sometimes meet with a good deal of complacent utterance on the superior artistic effect of modern photographic landscapes in which sky effects are introduced, coupled with a sort of compassionate reference to the days when, it is said, it was the highest praise to speak of a negative as having an absolutely opaque sky. We think, however, that it might be questioned whether, on the one hand, the free use of printed-in skies is not more frequently than otherwise productive of a result whic h is neither true nor artistic; and, on the other hand, whether there was at any time such a general approval of a blank whiteness in the skies, and absence of endeavor to obtain the beautiful effect of nature, as exhibited in the varied masses of cloud and clear sky, as is implied in the position thus taken up.

That there has been from very early days an appreciation for natural cloud effects in photographs, and an endeavor, not without success, to obtain them, may easily be demonstrated. One set of pictures alone, the photographs of sea and sky produced by Gustave Le Gray some thirty years since, will suffice to show that there was in the early days of photography no lack of recognition of the beauty which existed in the atmospheric regions, or of the improvement which a representation of these beauties conferred upon the photographs in which they were delineated. We think that some latter-day photographers would be rather surprised, if brought to a collection of the best work of this character, produced so long anterior to the gelatine bromide process, the rapidity of which they may suppose to be essential to anything like a decent representation of the fleeting effects of moving water and sky.

The other part of the question,—that as to whether the free use of printed-in skies, so commonly indulged in, is, generally speaking, an advantage, and if not why it should be disadvantageous, and under what conditions the representation of cloud effects may be satisfactorily introduced so as to be an improvement to the picture,—is

the one which will be of most present interest, and is that which we propose now to discuss.

There are two distinct faults, often met with separately, and not infrequently seen in combination, in the case of skies artificially introduced into photographic pictures. The first fault is that of badly printing in, and the second that of inappropriate selection of sky negative to accompany the landscape. When thus combined, as is by far too common, there is no doubt that a plain clean blank space to represent the sky is much to be preferred. Referring to the first evil—that of the sky being badly printed-in—we have frequently seen at photographic exhibitions, pictures in which there has been a sort of vignetting of the subjects bordering on the sky, in order to obtain a clear space for printing clouds upon, and then the cloud negative has been softened at the edges, or similarly vignetted, as it were, in order to avoid any sharp edge from being noticed. We can call to mind—and no doubt many of our readers can do the same—cases wherein the foliage and twigs bordering on the sky, even in foreground objects, and the masts and cordage of boats and ships in a similar situation, have been thus weakened and reduced to mere smudginess. The effect has been, in so far that there can be said to be any effect, other than that of being spoiled by the proceeding of sky printing, to represent these parts of the picture as half lost in smoke or fog. Some of the weakness we speak of may be due to halation, but if such exist, there is no need to exaggerate and emphasize it by the senseless method of sky printing to which we have referred. Contrast such a flat, stale, and unprofitable work with the beautiful, forcible delineation of twig and leaf, mast and cordage, against the sky, which will be found in good paintings, and in the most successful photographs. There is no need, with this striking representation of near objects against the sky, to have anything like harshness. It is Nature's own representation, beautiful to the eye, and beautiful when properly reproduced, either by painting or photography.

We have spoken particularly of the evil of weakening near objects when in juxtaposition with the sky. With distant objects the excuse may be put forward that it is right that they should appear somewhat subdued and lost. Certainly they should; but ærial perspective does that for us, and the tendency of the photographic process is commonly to make them appear too faint. Even distance, therefore, will generally be injured by the double softening involved in the method of sky printing of which we have spoken.

Another fault which belongs to the manipulation of the sky negative is one that is not often met with, and consists in the leaving of a visible edge to the printing that is done from the cloud negative. This fault and its remedy are so obvious, that there is no need to go further into the matter. The other part of the question, that of the selection of cloud negatives appropriate to the picture to which they are to be added, is one on which much might be said. It is, however, a fact that people generally are so little observant of the atmospheric phases of nature, that a cloud scene taken almost at random will, if carefully printed in, and not made too dark, convey the idea of an improvement upon a blank sky, to the majority of those looking at it. That this failing to notice critically the kind of sky and clouds in nature that accompany particular scenes, extends beyond the general uncritical public, is evidenced by the fact that many paintings—even those exhibited in our Royal Academy—are declared by competent judges to err in this particular.

Those who desire something more than to add to their landscapes a certain prettiness that will please the uncritical, will endeavor to select cloud negatives representing such a condition of the sky as might be in keeping with the rest of the picture, both as regards possibility or truthfulness, and artistic effect as satisfying the eye of the spectator. Towards the fulfilment o these conditions certain rules or common-sense principles may be laid down. One point to be observed is that the sky printing should not be carried to too great a depth. There are certain special occasions when the sky may appear very dark and lowering, but in ordinary landscape work, when a fair-weather scene is represented, it is only the high-lights of the picture that will appear lighter than the darkest part of the sky. Moreover, if there is anything wrong or unsuitable in the cloud negative, it may pass unobserved when lightly printed, whilst, if printed deeply, the errors of selection will be so much the more prominent. Defective manipulation, too—such as showing a white line or decided edge—will be so much less noticeable, and more easily remedied by touching, when the sky printing is kept light.

When deciding to print-in sky backgrounds, there are two courses open to the operator. The first, and probable most usual course, is to purchase cloud negatives from those who make a specialty of this branch of photography. In favor of this plan it may be urged that it is by no means an easy thing to secure clear, vigorous negatives of a cloud character by those who are only accustomed to ordinary work with the camera. Then, again, there may be considerable delay in waiting for a favorable sky for the purpose. In towns, moreover, there is commonly such an amount of mist or smoke as to interfere with the work; whilst in towns, again, it may not be practicable to get such an extent of sky clear of obstruction down to a tolerably low horizon, as it is desirable to have for sky negatives in general. Whilst on this last point, we may mention that we have met with the statement that it is a mistake to take a sky negative to a low horizon, as clouds low down have not the forms which ought to be introduced higher up in the picture. The latter clause of this statement is evidently true, but it does not involve the former part. On the contrary, it is as wrong to print clouds belonging to a part of the sky near the zenith, low down towards the horizon, as it is to print horizon clouds high up in the picture; and if the cloud negative itself is not taken to a tolerably low horizon, it becomes necessary, when printing a negative having some part of the horizon low, as is usual with the greater number of landscape negatives, to bring clouds properly belonging to the upper part down to the horizon. It is therefore desirable that the cloud negative itself should be taken down to a low, unobstructed horizon. When the subject of the landscape or scene is such that there is no low horizon, of course only the upper part of the sky negative will be required and will be used. A drawback to the use of purchased cloud negatives is the possibility of seeing the same clouds figuring in landscapes by different operators. On the other hand, in addition to the advantages which we have pointed out, there is the advantage that purchased negatives are generally on paper, and may therefore be printed from either side so as to suit the direction of light prevailing in the rest of the picture.

Whether the cloud negatives are the work of the landscapist himself, or are purchased, there are certain rules which should guide him in the selection of a particular sky. Such, for instance, as that of a calm, sunshiny picture, should not be

accompanied by clouds characteristic of a stormy or tempestuous scene. Common-sense, added to an attentive observation of nature, will best guide the photographer in this matter. One of the most daring flights of incongruity, but one which many of our readers will doubtless remember to have met with, is the combination of a sky having powerful masses of cloud behind which the sun is evidently shining and illuminating their edges, with a scene in which there is sunlight illumination, coming from one side or from behind the camera.

The time is at hand when many workers are preparing negatives and prints to figure at the autumn and winter exhibitions. We hope to see that the faults which we have mentioned as so disfiguring to landscape photography have become rarer, and that it will be more universally realized that printing clouds into a landscape sky is by no means certain to be an improvement, but is an operation that, to be successful, requires considerable judgment in selection, and great care and nicety in execution.

NATURAL CLOUDS IN PHOTOGRAPHS.

In our article last week on cloud effects in photographs, we dealt with the subject of printing clouds from separate negatives into pictures in which cloud effects were either originally absent, or had been removed to make way for those introduced by separate printing. We propose now to take up the question of what are called natural clouds in photographs, by which expression it is understood that the clouds and accompanying landscape or view have been photographed simultaneously upon the negative.

Seeing that most successful photographs are occasionally produced, in which the sky shows with beautiful natural effects of cloud and variety of tone, at the same time that the rest of the picture comes out properly, it is worth while to consider what are the conditions under which such photographs have been made, in order to ascertain whether such conditions may not be more generally fulfilled; so that at all events a greater proportion of photographic pictures than has hitherto been the case shall be produced with the effects of sky that have actually accompanied the rest of the scene, rather than have a sky either blank, or filled up with cloud-effect which may or may nor be such as would be natural in connection with the view.

It will be noticed that generally those pictures in which natural clouds appear with sufficient force are pictures of sea and sky, or of snow scenes. In these cases the exposure required for the foreground and other objects is so short that the sky itself is not much overdone when exposed simultaneously with them. The production of natural clouds in the negative is, however, not strictly limited to the cases mentioned, and the question before us is whether this accompaniment of a natural sky cannot be more extensively made use of than has generally been the case hitherto.

The difficulties attached to the general production of landscape negatives with accompanying clouds in good relation to the rest of the picture, belong to deficiencies of the photographic representation of the images presented to the camera coming under the head of optical or chemical causes; the means to be taken to overcome these difficulties will then relate, firstly, to the removal of such deficiencies themselves by the adoption of means nccessary to obtain the most perfect photographic representation, and secondly to mechanical or other means for removing or abating the deficiencies which cannot otherwise be completely eliminated.

Two notable deficiencies or defects in the photographic process which militate against the successful production of clouds along with the landscape are, one, that the photograph does not register truly the varying degrees of light, but after a certain amount all high lights are represented by one equal or nearly equal degree of intensity; and the other, that the colors attaching to the objects in the landscape, green particularly, have not a photographic value proportionate to their effect upon the eye of the beholder, so that in order to get them represented as sufficiently light in the photographs, those parts which have a more active color—such as the sky—must be disproportionately over-exposed.

To take first the failing of the photographic process to register differences in the high lights. It is evident that this failing will, when it exists to any great extent, show itself by rendering the sky of one even tone, instead of exhibiting that variety amongst the lights which mark cloud forms. In this connection it must be noted that differences in the preparation of the sensitive film, and of the methods of development, will produce marked difference in the degree of truthfulness with which different amounts of light will be registered in the picture. We have known gelatine plates in which lights that we may call those of the second order would very soon overtake those of the first order, and the resulting picture was one consisting much more largely of one monotonous tone in the lights than ought to have been the case. Such pictures would be said to be deficient in "sparkle," the word being used to define that crisp standing out of the highest lights upon those of the second degree, which we see in nature, and which lends such a charm to a more perfect production, either of the camera or pencil. This particular defect is by no means to be confounded with want of density. It may even be accompanied by excessive density, whilst on the other hand a thin image may possess good gradation, and only require the application of an intensifier to produce a perfect result. The want of true registration of light is not confined to rapid plates, though probably it is in them most frequently found. We remember to have met with it in a striking degree in the wet collodion era, when working with a collodion iodized with cadmium only. Not that all cadmium collodion showed itself thus inapt, but in our own practice it was rather characteristic of this iodizer.

In addition to the particular constitution of the sensitive film, the mode of development has considerable influence in modifying the extent to which the more exposed portions of the plate give evidence of having received varying degrees of light acting upon them. We have found that to commence the development by immersion in dilute ammonia, as has been sometimes advised, has tended in our hands to produce that flatness which is due to insufficient discrimination of strong but varying lights in the picture. We speak with some diffidence on this point, as the particular mode of development referred to has been strongly recommended by some workers whose opinions must be considered as weighty. On the other hand, some pictures, in which the registration of lights throughout has been particularly good, were developed, as we were informed, with a very large amount of bromide, the negatives having been much too greatly over-exposed to come up well under ordinary treatment. We recall to mind a set of photographs of this character shown by Warnerke at one of the technical meetings of the Photographic Society of Great Britain. These pictures, it is true, were of interior subjects, but the contrasts of

light were in nature very strong, and the results were so good that we feel tempted to inquire whether that particular proceeding—*i.e.*, long exposure and highly restrained development—may not be the best to adopt when practicable. If such prove to be the case, the expression "over-exposure" must be withdrawn, or used only as relative to the exposure that would suffice with a more customary development. The question of the best means to adopt in order to obtain a more perfect registration of the degrees of light in the subject to be photographed is a very interesting one, and one that deserves fuller investigation than it has hitherto received. Meanwhile, as an aid to the reproduction of cloud effects in our pictures, if for no other reason, we must select such plates and such method of development as we find to give the truest registration of various degrees of light.

The next point to be considered is the difficulty caused by the photographically inactive character of the light proceeding from the foreground and even distant objects, such, for instance, as the green of the landscape, compared with the bluer tint pervading the sky. Here, of course, we may reasonably hope for help from the orthochromatic methods of preparing plates sensitive to the less refrangible rays, and from the use of the color screen. The elegant method of preparing orthochromatic plates recently described by Ives* puts it in the reach of every one to sensitize plates either with erythrosine or chlorophyl; while the recent announcement by Dr. Wollheim,† that phyllocyanin produces orthochromatic effects identical with chlorophyllan, will probably cause many experimentalists to substitute phyllocyanin for chlorophyllan in Ives' latest method of employing such sensitizers.

Remembering what excellent work in pictures with natural clouds has occasionally been done in the past, we look forward, with the help of the orthochromatic principle, and of more thorough investigation of the conditions on which true registration of degrees of photographic action depends, to seeing a much extended use of the skies incidental to the view that is photographed than has hitherto been adopted.

We come next to the mechanical means that have been employed for giving less exposure to the sky than to the other parts of the picture, so that the overpowering effect of light from the clouds, as well as from the clear portions of the sky, may be restrained sufficiently to prevent them from being lost in one general light, whilst the foliage and foreground are receiving sufficient exposure to bring them out. An objection that may be urged against methods of this kind is, that it is not possible to shut out the sky with anything like exactness, and that if it were possible, there would remain a hard line destructive of all artistic and realistic effect. Where foreground objects rise into the sky in places, it is obvious that in shielding the sky the foreground object will be shielded also, and so come out unnaturally dark. Nevertheless, there is frequently an advantage in some of the contrivances that have been adopted, and such are often employed with benefit. A very early contrivance was that of the late T. Sutton, who placed the diaphragm in a sloping position, the upper part forward. In this way the light from the foreground was admitted through a circular aperture, whilst the opening presented to the sky was in effect a narrow oval having its long axis of the size only of the diameter of the circle. This arrangement was contrived for use with a single lens. For a doublet, a special arrangement

* *Photographic News*, page 385. † *Photographic News*, page 513.

would have to be fitted up inside the lens tube. Another contrivance now in common use is a spring shutter passing from side to side, and having its opening so cut as to give longer exposure to the foreground than to the sky. Yet another arrangement is one which we remember to have seen very thoroughly worked out by W. K. Burton. The general character of this arrangement is a flap shutter consisting of a piece of cardboard cut nearly to the form of the sky in the scene. This shutter is worked either inside the camera, when the hinge on which it turns is at the bottom; or in front of the lens, when the hinge is at the top. In either case the flap must be sufficiently far from the lens to prevent it from shielding too vague and uncertain a portion of the picture, and yet not so far as to cause a perceptible line to be formed. The general exposure is given by a second flap or by a cap, and the flap itself is only opened for such a short space of time as may be deemed requisite for the sky. All such mechanical means are necessarily imperfect, for the reason given, that there is no definite edge permissible, and we must either shield part of the view itself, or permit that portion of the sky contiguous to any other part of the picture to receive more exposure than the rest of the sky.

There is yet another means of obtaining the representation of the cloud forms in the sky of the negative, and it consists in reducing the intensity of the sky on the plate, or of intensifying the rest of the picture whilst the sky is not intensified. For this purpose it is necessary that a good gradation of tone exist in the sky of the negative, although it may in its original condition be too intense with relation to the rest of the picture. We have seen good effects produced in both ways. If it is desired to make the difference of intensity gradual, the negative may be treated quite wet; and if the reducing process is employed, the solution, ferric oxalate, ferricyanide, or hypochloride as preferred, used with a soft large brush, the sky edge being kept lowest. If it be desired to make the edge rather more sudden against some object rising against the sky, the negative may be treated when in a partially dry condition. The method of partial intensification is adopted when the sky itself is of proper density, but the rest of the negative is lacking in vigor. The same variation of treatment, either whilst entirely wet or when partly dry, is admissible, as has been referred to in connection with the reducing process. For this partial intensification we have found the method with iodide of mercury followed by Schlippe's salt described in the last YEAR-BOOK very convenient. The mercury solution is applied with a brush, and if in any place it has extended more than was intended, it is only necessary to avoid such place when following with the Schlippe's solution. After washing, another immersion in the hypo will remove the intensity given by the mercury where it has not been fixed by the application of the sulphantimoniate.

Of the two methods of producing cloud effects in photographs, we certainly prefer, when the subject admits of it, the method by which the sky actually accompanying the view is represented; but either may be used with advantage according to circumstances, although a plain sky is to be preferred to such printed-in effects as have too often been presented.—*Photographic News.*

THE ORIGIN AND TECHNOLOGY OF PHOTOGRAPHIC CHEMICALS.

Fifteenth Paper.—Hydrochinon.

OF all the recent additions to the useful photographic reagents, none has made more enthusiasm than the wonderful hydrochinon. In the October number of this journal of the year 1887, Von Soten gives a very succinct and thorough recital of its use as a developer, and he adds a formula which is completely satisfying, and which will enable the beginner in photographic work to obtain excellent results. Balagny, the well-known French photographic expert, confirms Von Soten in every particular, and has given up the use of pyro. Hydrochinon (C_6H_4 $[OH]_2$) is almost identical in composition with pyrogallic acid (C_6H_3 $[OH]_3$), though one is produced from nut galls and the other from coal tar! Hydrochinon was first discovered by Wöhler in 1844, as a by-product in the distillation of kinic acid, a constituent of quinine bark, and later by oxydising chinon. Pelletier and Caventon found it and called it Brenzchinic acid. It is also produced as a product of decomposition of arbutin ($C_{25}H_{34}O_{14}$), this giving besides hydrochinon methylhydrochinon ($C_7H_8O_2$) and two molecules of sugar (2 $C_6H_{12}O_6$). Körner produced hydrochinon by melting paraiodophenol with potash. Salkowski, Radkowski, Leppert, Strecker, and many other chemists, worked on hydrochinon, and for years contributed to the literature of chemistry their results, purely as scientific facts in the development of the newer organic chemistry. Who the first one was to adapt it to photographic use is not known.

"Its capacity as an oxygen absorber," says Von Soten, "is even greater than that of pyro, the comparative energy of my normal developers being as nine to seven in favor of hydrochinon. But this affinity for oxygen is not as greedy as that of pyro, and its action is therefore less violent and under better control, and in this property of applying its great reducing force slowly, gradually, without unnecessary waste and without exhausting its strength from the outset, I find the chief advantage of hydrochinon over pyro."

He gives as working formula:

Solution No. 1.	Soda Carbonate, ...	50 grains.
	Water, ...	1 ounce.
Solution No, 2.	Hydrochinon, ...	12 grains.
	Soda Sulphite Crystals, . . .	60 grains.
	Water, ...	1 ounce.

For use mix,

No. 1, ...	1 ounce.
No. 2, ...	2 ounces.
Water, ...	1 ounce.

and this diluted by another ounce of water will be found to give good results, without staining plates or fogging.

As the manufacture of hydrochinon is in its infancy, but little is known of the methods to produce it in quantity, so naturally the price is high as compared with pyro, but the lasting quality and sure results warrant its use most emphatically. The same conditions that accompany pyro as to intensity and detail are associated with hydrochinon,—used in greater proportion it gives strength, and used in more dilute

solution giving detail. The amount of alkali in Von Soten's formula is amply great, and it is not advisable to force by adding it; rather get intensity first, and, if necessary, put the unwashed plate into a slightly alkaline solution in water, and soak for a short time to bring up detail.

Hydrochinon comes either in hard rhombic crystals or in a soft needle-like crystalline form of pinkish white color; is soluble in water and more readily in hot water, also in alcohol and ether. An alkaline solution of it is apt to be colored to a red brown by exposure to air, and with ammonia is soon oxydised. For this reason it is advisable not to make a "one bottle" developer, preferably keeping alkaline and hydrochinon solutions ready for mixing.

As yet methylhydrochinon has not been reported on as to utility in photography, but doubtless owing to its property of reducing silver salts, is worthy of experiment, and would give enjoyable points of investigation.

It is to be regretted that photographic workers have so little opportunity for working together, as such unity of labor abroad shows how wonderful are the things brought out by adding united efforts.

F. H. ROSENGARTEN.

PHOTOGRAPHIC OBJECTIVES.—FACTS AND FALLACIES REGARDING THEM.

(*Continued from page 216.*)

THESE precautions are alike necessary for the optician and photographer, whether for the purpose of determining the quality of the lens or for making comparisons between several lenses, and it is a test which every camera ought to undergo. After the plate has been exposed and developed, we may find that although we have a sharply-defined image on the ground glass, the one on the plate is very indistinct, which shows that the chemical foci may be sharper or longer than the visual.

To determine the extent of variation a number of exposures must be made, placing the ground glass within or beyond the visual focus until as sharp an image is obtained in the negative as on the ground glass. We now have all the principal data to enable us to proceed with the correction of the lens. First is the focal length, next the spherical aberration, then the amount of distortion, and last, but, for the present, most important, the difference between visual and chemical focus.

To attempt to correct any one of these qualities will disturb the others, not only that, they are often to such an extent antagonistic, that to improve one will considerably augment another fault. It is not within the province of this paper to show you what the likely changes would be which would be followed to improve the objective, but I can indicate what some of the results would be which would arise. For instance, if the visual and chemical foci do not coincide, it is evident that the objective is chromatically over or under corrected, and if the objective would otherwise give a good image the inner or cemented surface would probably be changed; this might very naturally effect to focal length, which, in a telescope objective, would hardly be noticed. The focus of the lens might easily be doubled before the proper correction would be reached, and then changes would again be necessary to bring the focus to

the proper distance, which would again disturb the chromatic correction, as well as perhaps the spherical, which latter designates the amount of curvature of the image. Thus a change of 1-16 inch in the radius of one of the inner surfaces, which would hardly be noticed in an ordinary lens, might lengthen or shorten the focus of the photographic objective several inches. The changes which sometimes occur are often surprising and inexplicable, even to one who is accustomed to them. It may be found that the amount of spherical aberration is so great that no amount of changing will bring it to the proper standard. One means of partially overcoming it would be the decrease in the size of the lenses, which would mean that they will admit less light and consequently slower.

The thickness of the lens which causes the distortion must be accurately determined. However, we will assume that the various corrections are finally combined as far as is possible, and the skill of the optician must determine to what extent they will be. It may be impossible to combine the spherical and chromatic aberrations sufficiently to make the former acceptable, and a new series of experiments will have to be undertaken based on a combination of new glasses.

After a lens is completed which meets the ideal of the optician, it may be said, "We can understand that the first lens has involved a great deal of work, but after the completion of the sample, none of these difficulties will arise." To a certain extent this is true, but it must be remembered that the optician's work is almost entirely empirical. Each lens is an experiment; there is an individuality in each which cannot be overlooked. A lens is rarely, if ever, perfect when completed, and each one is a special study. There are certain features which rarely, if ever, change when working under the same formula and using the same glass, such as coincidence of visual and chemical foci, centering and size; but others, such as homogeneity and refrangibility of glass, sphericity of surfaces, length of focus, are variable, and often can only be reached after repeated trials, and, in many instances, cannot be obtained at all.

There is one point which I have not yet touched, and which is of the utmost importance, and that is the sphericity of surfaces. To simply grind and polish a lens is exceedingly simple, to do so and obtain spherical surfaces is extremely difficult.

Instead of spherical, a surface may be, and often consists of, a series of elevations and depressions. They may be in the shape of rings, or may be confined to spots, or may radiate from the centre, in which way I have seen them as pronounced as the spokes in a wheel. Heat, even when moderate, when applied to a certain portion of the lens, causes the same effect; there are optical tests by which you can easily see the expansion of glass after the finger has been allowed to rest upon it for a moment. The same effect may be obtained by fixing the lens in the mounting.

I have often examined lenses which were so distorted by the pressure exerted on them in the mounting, that it seemed almost impossible that they could form even a fair image. What is the effect when these conditions exist? First of all, a lack of the sharpness over the plate, and then depth of focus. An elevation, say, on a convex will give a shorter focus than the focal point for the entire surface for all those rays which fall upon it because of its shorter radius, whereas a depression will cause a longer focus; so that instead of all the rays combining in one point there are a series of focal points. When depth of focus is caused by reason of this fault it is to be condemned, because it is at the sacrifice of definition, and any lens possessing it

cannot be rated as good. Depth of focus when caused in this manner is one of the qualities which can be determined without comparative tests, and every lens purchased should be tested to this end. A good means to determine the proper correction of the surfaces is by the use of a diaphragm. Focus for a sharp image on the ground glass by means of a magnifier with the full opening of the lens, and note this point in the camera. Then rack out of focus, and insert a diaphragm sufficiently large that the image can just be distinguished, and again focus by means of the magnifier. If the objective is perfectly corrected this point will coincide with the first, and if not, as was stated before, it is a serious fault, because there will be a different focus for each diaphragm.

Depth of focus and speed are incompatible, inasmuch as both qualities depend on the aperture of lenses, assuming of course a relatively large diaphragm and focal length, while the former decreases with the increase in the aperture and the latter increases. Depth of focus is no doubt a very desirable quality, but to obtain it in a legitimate way with high speed is simply impossible. In two lenses of similar construction of the same diameter and focus, it will be exactly similar, and the ratio of depth will increase with the decrease of the diaphragm. In view lenses depth of focus can almost always be obtained by the use of diaphragms, and this is also true in objectives specially made for portraiture, but in these the same is obtained by placing two systems further apart, or varying the distance of the individual lenses, which means nothing more nor less than the production of spherical aberration.

The extent of flatness of field and distortion in lenses are variable quantities, and although depending to a certain extent on the diameter of lenses, exist to a greater or less degree in one or the other lens according to the amount of skilled care of the optician. The tendency almost since the first use of lenses has been the increase of speed and consequent increase of aperture of lens, and although the advance has been and is slow to the uninitiated, it means an enormous amount of work to the optician. Every degree of increase represents a considerable outlay of mental and manual labor, and can only be maintained by correspondingly greater attention to the minutiæ of work. Each individual reproduction is to him a source of pride, and he works with love and ardor over every step of his work. Outside of this, however, he is fully aware of the detrimental influence of imperfect work, and his ambition is not only to accomplish the highest result, but to maintain it after it has been reached. The actual work of grinding and polishing is comparatively trifling, as is shown in the cheaper form of lenses, where the cost of glass is just as high, or wherein the lenses are used whether good or bad, unless they have faults easily noticed. The time-consuming and worrying work is that of continually testing and correcting the lenses. When we remember that the best, although none too good, involves the amount of work I have endeavored to portray, you will no doubt feel that the optician does not ask too much remuneration for it.

Now as to homogeneity of glass. A disk should be of the same consistency throughout; when it is not, it possesses either impurities or air bubbles, which are usually easily seen, or so-called striæ, which are not so discernible, but of greater importance. These are caused by the unequal consistency of the glass, or unequal annealing, and have an appearance similar to a glass of water when strong sugar water is poured into it, and is not well mixed; or heated air as it arises from a stove

or hot ground. All glass not especially made for optical purposes has them, as can be easily seen by looking through it edgewise, even in the best plate. Of course, no disk is used which shows them, or air bubbles, or impurities, on a preliminary examination; they often appear before the lenses are completed, and work then ceases, but very often they cannot be detected until the lenses are finished. Air bubbles can easily be seen by any person, and when they exist the optician must judge whether they are sufficient to impair the salability of a lens.

If, however, a man who has a reputation to guard permits it to pass, and I would add it is as hurtful to his eye as to any person, then the purchaser should not be hasty to condemn it, for it then usually possesses merits which far outweigh this disadvantage. Take, for instance, an air bubble as large as a pin head in an ordinary size lens. Its area is so infinitesimally small as compared with the area of the lens, that it is of no account whatever, and does not affect the lens in the least.

Although it may sound strange, I would for my part select a lens containing an air bubble in preference to one without it, provided it was from a reliable firm.

Striæ, however, which are difficult to detect, are positively injurious when existing to any extent, inasmuch as they refract the rays passing through them in different directions, thus preventing them from combining to form the image, and they sometimes may cause a false light. They often pervade an entire lens, and occasionally can be seen with the naked eye, but as a rule not.

An easy method of looking for the most glaring is as follows:

Unscrew the systems and examine each separately. Place one in the camera or on the table in an upright position, and back of it at any distance a lamp or gas jet. Look for the focal point by means of a white paper and get the eye in the same position, which can be easily done after a little practice. The lens will be found brilliantly illuminated and the striæ will stand out as dark shadows. When a few small knife-edge threads show, they are of little moment, but when in a circle of light there is a wavy appearance, it is generally of other striæ, which are injurious, but cannot be determined in this manner.

I have shown how some of the faults may be determined by almost any person, but others, such as definition, distortion, amount of speed, can only be judged by a comparative test, or by a person of wide experience. Comparing a lens with one of known excellence is the only reliable manner, but then the following points, among which I recapitulate those already mentioned, should be observed: Determine coincidence of visual and chemical foci; determine coincidence of ground glass and plate in plate holder. Use flat plates when ground glass is flat; if this is not flat use plates corresponding with it. Determine spherical correction by means of diaphragms.

The two lenses should be for the same size plate, and of about the same aperture and focus. Lenses should always be tested first with full aperture or large stops of the size, as small stops correct spherical aberration in good lenses as well as poor ones. If desired they can be done with small stops later on.

Make comparisons under the same conditions of light. For spherical aberration and distortion focus on printed matter, fastened to a screen or a map, and have the lens square with the objective and within two or three times the equivalent focus of the lenses, as they are then under the most strained conditions.

For depth of focus, also stationary objects which have thickness or a view, al-

ways focus the lens on the same point, and never make a comparison without the use of a magnifying glass for focusing as well as for examining the negatives.

Last, but most important, make the comparison in the spirit of arriving at the truth, and do not permit your judgment to be biased or influenced by your feelings.

EDWARD BAUSCH.

THE PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

A STATED meeting of the Society was held Wednesday evening, September 5th, 1888, with Vice-President John G. Bullock in the chair.

The Secretary reported the receipt of a pamphlet from the Royal Meteorological Society of England, containing the first report of the Thunderstorm Committee on Photographs of Lightning Flashes.

The Committee on membership reported the election of Mr. Daniel R. Hanawalt as an active member.

Mr. Wm. H. Rau, representing the Society as one of the Directors of the American Lantern Slide Interchange, reported the organization of that enterprise, eight of the nine Societies represented at the conference held in this city in February last having adopted the rules then agreed upon. The several Societies have appointed the Directors, and a vote has been taken, resulting in the election of Mr. George Bullock, of Cincinnati, as Manager, with Messrs. F. C. Beach, of New York, and Edmund Stirling, of Philadelphia, as assistants.

The Committee on Presentation Pictures for 1888, whose decision as to one of the pictures for this purpose was deferred from June meeting, reported the selection of "The First Lesson," a flash-light photograph by Mr. John Bartlett.

Mr. Edmund Stirling presented a resolution providing for the appointment of a special committee to have the care of all lantern slides belonging to the Society; to make proper effort to add to the collection of slides from choice negatives made by members,—prize exhibition pictures, presentation pictures, etc.,—and to prepare regulations, subject to the approval of the executive committee, by which members may have the use of slides for private exhibition. After brief discussion, the resolution was unanimously adopted.

Mr. Miller called attention to a process for altering the tone of a bromide print, which he had noticed in the *Bulletin de la Société Francaise de Photographie* for April, 1887, and showed a print so toned. The bromide print is well washed after fixing in the ordinary manner. It is then immersed in a ten per cent. solution of bichloride of copper, thoroughly washed, exposed to light for a few seconds, and finally re-developed with oxalate and washed with acidulated water. The chloride of copper converts the original image into chloride of silver. After the removal of the excess of chloride by washing, the new image in chloride of silver is sensitive, and after exposure to light is thrown down again as metallic silver. The color of this image is a coal black, almost entirely free from the characteristic green tint of bromide prints.

Mr. Bartlett mentioned a curious result obtained while experimenting with bromide paper. A sheet of Eastman's bromide paper was exposed for a fraction of a second to a weak light from a gas flame, then immersed for a few moments in a

bath of pure chloride of copper (strength not estimated), and exposed wet under a negative to sunlight for one minute until an image was formed; on drying, the impression was found to be of a greenish tint, and seemed to be perfectly permanent without any fixing in hypo, although exposed to the direct rays of the sun. Mr. Bartlett had not pursued the subject further, but merely called attention to the phenomenon as curious.

Dr. Mitchell stated that recently having occasion to copy an engraving, and finding he had no slow plates on hand, used a piece of transferotype paper on which to make the negative. The film was transferred to glass and then to gelatine skin in the same manner as with a regular "film negative," the whole operation being eminently successful.

Adjourned.

ROBERT S. REDFIELD, *Secretary.*

THE HYDROCHINONE DEVELOPER.

THE *Amateur Photographer*, for the 15th of August, contains two letters on hydrochinone as a developer: the first of these is enthusiastic in praise of all that may be accomplished with hydrochinone, and its author, M. Mathet, gives the formula of a solution in which the use of sodium, carbonate and sulphite is dispensed with, the alkaline reagent employed being sucrate of calcium, which is obtained by dissolving slaked lime in a solution of cane sugar, and filtering.

The other letter, by M. L. de Laporterie, is in deprecation of attempts to replace, by any other agent, the time-honored pyro. The author says, "The principal objection to the hydrochinone process is that which for certain amateurs constitutes its great superiority; that is the constancy of the formula employed. Up to the present time it may be said that hydrochinone is a developer for beginners, for it allows of no latitude in the proportion in which the constituents of the bath are used. The great difficulty is in the selection of a bath of the proper age for the exposure of the plate, and although M. Balagny replies that there can be no risk in always beginning with a very old bath, the operation then becomes a work of patience that often yields only a harsh negative. I am convinced that hydrochinone will eventually displace pyro, but the development is still too brutal, and the agent will only become really serviceable when the operator shall be able to vary the constitution of the bath according to the necessities of the plates."

M. de Laporterie has probably not experimented with baths of varied concentration. The formula given by M. Gervig, and published in the current volume of this Journal, page 125, gives an admirable bath, but it will, in most cases, be found too strong, even for instantaneous exposures; it will bear dilution with its own volume of water, or even more. Let any one who spoils his first plate in a hydrochinone bath remember the number of plates he lost by the use of pyro, and he will hardly expect to obtain a perfect plate on first trial; the probabilities of success will, however, be greater than with pyro. If an old bath be not at hand for the first trial, a portion of the new one may be diluted with water, and it will not be necessary to employ a stronger one until it becomes evident that some of the details are not going to appear. Density is then a question of time.

W. H. G.

PHOTOGRAPHIC SECTION OF THE ROCHESTER ACADEMY OF SCIENCE.—Health permitted President Croughton to once more take the chair at the regular meeting of the Section August 28th. Secretary Punnett tendered his resignation as an officer on account of his leaving the city soon to take a four years' course in chemistry at the Case School of Applied Science, Cleveland, Ohio. Besides making a few recommendations for the future, he read the following list of subjects treated by members of the Section, and illustrating what good work the Section had been doing. As an aid to some amateur society, which may be at a loss for a subject, I give it in full.

November 29th, 1887, Magnesium Flash Light, by H. W. Mathews.

December 20th, 1887, New Mode of Positive Printing, by President Croughton.

January 3d, 1888, Lantern Exhibition by the Section to their friends.

January 17th,* 1888, Positive Printing (Albumen), by C. F. Hovey.

January 31st, Hydrochinone Developer, by H. W. Mathews.

February 14th, 1888, Platinotype Process, by Secretary Punnett.

February 28th, 1888, Uranium Nitrate Toning of Bromide Prints, by President Croughton.

March 13th, 1888, Bleaching and Re-developing of Bromide Prints, by President Croughton.

March 27th, 1888, Toning Albumen Paper, by C. F. Hovey.

April 10th, 1888, Lantern Exhibition by the members to their friends.

April 24th, 1888, Vest Camera, by C. J. Player.

May 8th, 1888,* Orthochromatic Photography, by E. W. Horne.

May 22d, 1888, Carbon Printing, by President Croughton.

June 5th, 1888, Lantern Slide Making by the members.

June 19th, 1888, Prize Print Contest, Prize awarded H. W. Mathews.

July 3d, 1888,* Paper read on Dry Pyro Development, by Jas. Streeter.

July 17th, 1888, Demonstration Dry Pyro Development, by Jas. Streeter.

July 31st, 1888, New Enamel Paper, by Jas. Inglis.

August 14th, 1888, Kodak Camera, by S. C. Jones.

(All the subjects except those marked * were demonstrated.)

A vote of thanks was extended to the retiring secretary, after which James Streeter, 65 East Main Street, was unanimously elected to fill the vacant office. The subject of the evening, a Lantern Exhibition, by C. F. Hovey, was thoroughly enjoyed by the large audience present. This exhibition was given to show what constituted a good lantern slide, also to show the difference between wet and dry plate slides. The decisions of the members were clearly in favor of the wet plate slides.

The members congratulated Mr. Guebelle upon his safe return from his western trip. The making of lantern slides by reduction by the members of the Section, under the supervision of Mr. C. F. Hovey, will be the subject for the next meeting.

Yours truly,

MILTON B. PUNNETT,

Retiring Secretary.

Address future communications to Mr. Streeter as above.

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1—5x8 Tourist Outfit, including 5x8 Tourist Camera Box, 2 Daisy Plate Holders, 1 Extension Tripod, and 1 Canvas Carrying Case, very little used. Price, new, $40.50, will sell for 30 00
1—10x12 Cone View Camera, Double Swing, new 52 80
1—14x17 New Haven Acme Portrait Camera, Single Swing, new 46 00
1—4x4 Standard Portrait Camera wet holder, new 14 75
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1—5x8 American Optical Co. Stereo Camera 25 00
1—6½x8½ Standard Portrait Camera, web holder 13 60
1—5x8 Blair View Camera, single swing 17 00

Lenses:

1—set ¼ Darlot Tubes 13 00
1—set ⅛ Darlot Tubes 18 00
1—No. 2 Euroscope Lens . . . 40 00
1—No. 5 Euroscope Lens . . . 100 00
1—$\frac{1}{12}$ Zentmayer Lens 40 00
1—4-4 Darlot Portrait Lens . . 20 00

1—4-4 Holmes, Booth & Hayden Portrait Lens	25 00
1—½ size Voigtlander Portrait Lens	10 00
1—⅝ Waterbury Lens	2 00
1—Focussing Glass	75
1—11x14 Pantagraph Lens, new	38 00
1—4x5 Dallmeyer ($56) Portrait Lens, nearly new	20 00
1—14x17 Roettger Portrait Lens	35 00
1—Set ½ size Tubes	18 00
1—No. 3 Euroscope Lens	50 00
1—½ size Darlot Portrait lens,	5 00
1—½ size Harrison Portrait lens, cut for stops	10 00
1—4x4 Harrison Portrait Lens, cut for stops	20 00
1—½ size Voigtlander Lens	15 00
1—Matched pair German Stereoscopic Lenses, in good order	15 00
1—4x5 Dallmeyer View Lens	15 00
1—Woodward Condensing Lens	10 00
1—4x4 Darlot Globe Lens	30 00
1—½ size L. W. Krantz Portrait Lens	12 50
1—½ size C. C. Harrison portrait lens	8 00
1—½ size Darlot quick acting Portrait Lens, central stops	18 00
1—No. 6, 17x20 Darlot wide-angle Hemispherical Lens	38 00
1—Extra 4x4 Chapman Portrait Lens	20 00
1—8x10 E. A. View Lens	5 00
1—Ross View Lens	5 00
1—H. Fitz Double View Lens, revolving stops	8 00
1—8x10 Voigtlander Portrait Lens	80 50
1—4x4 Dallmeyer Group Lens	50 00
1—4x4 Walzl Portrait Lens	20 00
1—¼ Beck Microscopic Objective, nearly new,	20 00
1—¼ size portrait lens	3 00

HUB BRAND

—DEVELOPING TRAYS.—

The "HUB" Hard Rubber Developing Trays are made of the best quality of hard rubber, are deeper (as will be seen by measurements) than the ordinary shallow Rubber Tray, and with bound corners and a lip for pouring.

They are a superior article, and should be seen by every photographer.

Size,	4¼ x 5½.	For Plates,	3¼ x 4¼, and 4 x 5.	1½ in. deep,	$0.66
"	5½ x 7½.	"	4¼ x 5½, " 4½ x 6½, 5 x 7.	1½ "	.74
"	5½ x 8½.	"	5 x 8.	1⅝ "	1.05
"	7 x 9.	"	6½ x 8½	1¾ "	1.15
"	8½ x 10½.	"	8 x 10.	1⅞ "	1.65
"	11 x 13.	"	10 x 12.	2 "	2·75
"	12 x 15.	"	11 x 14.	2⅛ "	3.75
"	15 x 18.	"	14 x 17.	2⅛ "	5.25
"	19 x 23.	"	18 x 22.	2¼ "	8.00
"	21 x 25.	"	20 x 24.	2¼ "	9.00

EASILY KEPT CLEAN.

"Hub Pressed Rubber Trays"

(Glossy) without ridges in the bottom to waste Developer.

Size,	4½ x 5¾.	For Plates,	3¼ x 4¼, 4 x 5, and 4¼ x 5½,	¾ in. deep,	$0.28
"	5½ x 8½.	"	4¼ x 6½, 5 x 7, and 5 x 8.	¾ "	0.56
"	7 x 9.	"	6½ x 8½.	1 "	0.72
"	8½ x 10½.	"	8 x 10.	1⅛ "	1.08
"	11 x 13.	"	10 x 12.	1¼ "	1.56

THE BLAIR CAMERA CO.,

BOSTON: PHILADELPHIA: CHICAGO: Sole Agents.

FOR SALE BY PROGRESSIVE DEALERS

L. M. PRINCE & BRO.,

MANUFACTURERS AND IMPORTERS OF

PHOTOGRAPHERS' SUPPLIES,

For the Professional and Amateur Photographer.

A FULL LINE ALWAYS IN STOCK OF

Blair Camera Co.'s Apparatus, and Accessories.

ALL BRANDS OF

Dry Plates, Chemicals, and Card Mounts, &c., &c.

Prince's Concentrated Developer.

Prince's Celebrated Concentrated Toning Solution.

☞ Send 20 cents for Illustrated Catalogue and Guide how to make Pictures.

148 WEST FOURTH STREET,

CINCINNATI, O.

Agents for The Blair Camera Co.

In OHIO, TENNESSEE, KENTUCKY and WEST VIRGINIA.

THE BLAIR CAMERA CO.

—ARE—

Agents for the following Goods

—FOR—

WESTERN AND MIDDLE STATES.

RICHARDSON'S GLACÉ LUBRICATOR.

Photographers' Brushes,

BOUND IN

METAL AND HARD RUBBER.

GRAY'S PERISCOPE LENSES,

Which are not a cheap copy of other existing forms of high grade lenses, but an entirely new design that can be well made, and sold at a low price.

AGENTS FOR WESTERN STATES

OF

Seavey's Photographic Backgrounds and Accessories,

ENTREKIN'S UNRIVALLED BURNISHERS.

GUNDLACH LENSES.

Beck's Autograph Lenses.

THE BLAIR CAMERA CO.

ARE

Manufacturers and Sole Agents

FOR THE

FOLLOWING GOODS.

Blair's Celebrated Apparatus.

"Hub Brand" Dry Plates.

"Hub Brand" Universal Developer.

"Hub Brand" Hydrokinone Developer.

"HUB BRAND" HARD RUBBER TRAYS.

"Hub Brand" Pressed Rubber Trays.

"Hub Brand" Ever-ready Paste.

"Hub Brand" Magnesium Flash Powder.

ORTHOGRAPHIC LENSES.

LUCIDOGRAPH LENSES

Mitchell's Anti-Cockling Mounting Solution.

TRIUMPH RUBY LANTERN,

And many other new specialties.

THE BLAIR CAMERA CO.,

BOSTON: PHILADELPHIA: CHICAGO.

PUBLISHED EVERY WEEK.

THE EYE

DEVOTED TO

ART, PHOTOGRAPHY AND LITERATURE.

Contributions from the Best Writers.

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SIX MONTHS, - - -	**1 25**
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OFFICE OF

THE EYE,

Exchange Building, Van Buren Street,

CHICAGO, ILL.

THE NEW ACME FLUE-HEATING PHOTO BURNISHER.

Patented Jan. 25, 1876.
Patented Jan. 18, 1886.
Patented Feb. 28, 1888.
Also Patents for Europe and Canada.

11 AND 15 INCH NEW ACME, WITH GAS HEATER.

This is not a Quadruplex, Complex, or Perplexing Machine.

IT IS SIMPLICITY ITSELF. TO SEE IT IS TO BUY IT.

No Moisture on Feed Roll or Burnishing Tool.

21 AND 26 INCH NEW ACME, WITH OIL HEATERS.

MOST ECONOMICAL.

11 inch roll, with gas or oil heater,	$25 00
15 inch roll, with gas or oil heater,	$35 00
21 inch roll, with gas or oil heater,	$55 00
26 inch roll, with gas or oil heater,	$65 00

BEST RESULTS.

Perfect Combustion. No soot to be heated over and over again. No disagreeable smell. Heat gauged by Thermometer, and held at one point by turning wick up or down. ☞ *SEND FOR DESCRIPTIVE CIRCULAR.*

Very Latest Burnisher Out.

It can be heated in five minutes.

The Handsomest Finish.

EVERY MACHINE WARRANTED. For Sale by all Stock Houses in the United States, Canada, and Europe.

MANUFACTURED BY THE

Acme Burnisher Co., Syracuse, N. Y.

PATENTEES AND SOLE OWNERS.

Office and Factory, cor. Water and Grape Streets.

SUN AND SHADE.

A PHOTOGRAPHIC RECORD OF EVENTS.

MONTHLY, 30 CENTS. YEARLY, $3.00.

CONTENTS.—JULY, 1888.

The August number will be issued at the end of the present month.

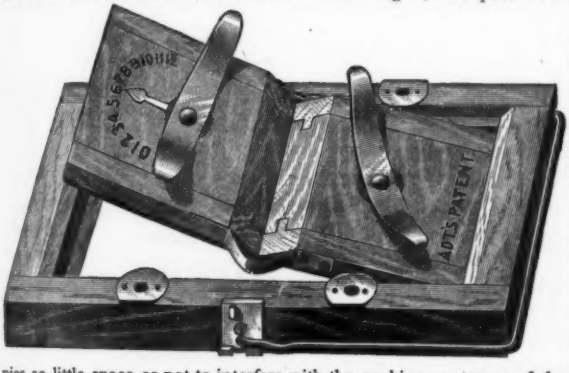
ADT'S PATENT PRINTING FRAME.

The Printing Frame of the Future.

As will be seen by a glance at the cut' the adjacent edges of the parts of the back-board are beveled outward, and the hinges placed on the sides with their axes on a line with the surface. This permits the attachment to the face of the back-board of a Heavy, Continuous, Elastic Felt Pad, manufactured especially for this particular purpose. This obviates the necessity of using a separate pad, which is so easily misplaced and lost. It will be seen that there is absolutely no strain on the pad in opening and closing the back-board, as it in no way acts as a hinge and will not become worn at the joint in the back-board, the hinges being of metal and placed on the sides.

This particular construction and manner of hinging can be used *without* a pad, which demonstrates the fact that the pad *does not* act as a hinge.

Adt's Patent Printing Frames are now supplied (without extra charge) with Adt's Patent Support, with which the frame can be stood on either end, and at four different angles, for exposure while printing.



One great advantage of this support, in addition to its convenience in supporting the frame, arises from the fact that it is out of the way of the printer when introducing the paper, or examining the print, for when the frame lies or is held with back up, the support instantly drops upon its stops for rest, and is entirely out of the way of the hand of the printer, so that he may remove or open the back-board, or replace it, as if there were no support present.

Again, it being arranged close around the sides and ends of the frame, it occupies so little space as not to interfere with the packing or storage of the frames, and when the printer places his frame for exposure the support readily finds its position for supporting the frame without any special manipulation by the printer.

Another valuable feature is Adt's Patent Tally, which, without any exception, is the best, strongest, and simplest in use. It is impossible for this Tally to get out of order, on account of its simplicity.

BEWARE OF IMITATIONS WHERE THE PAD ACTS AS A HINGE.

PRICES.

3¼ x 4¼	$0 50	6½ x 8½	$0 75
4 x 5	50	8 x 10	85
4¼ x 5½	50	10 x 12	1 15
4¼ x 6½	60	11 x 14	2 15
5 x 7	65	13 x 16	2 40
5 x 8	65	14 x 17	2 80

When made with backs to open lengthwise, an additional charge of ten per cent. will be added to the above prices.

ADT & BROTHER,

Sole Manufacturers,

WATERBURY, CONN.

FOR SALE BY ALL DEALERS IN PHOTOGRAPHIC GOODS.

QUEEN & CO.'S

"FRANCAIS"

RAPID RECTILINEAR LENS.

These Lenses are guaranteed to be at least equal, and if critically and scientifically compared will be found superior to the best productions of the most famous makers.

The principle causes and points of their superiority are the following:

FIRSTLY—

Being made of a quality of Glass which is entirely free from color, they allow more actinic light to pass through them than is usual for lenses of the Rapid Rectilinear type.

SECONDLY—

After The Francaise Lenses have received the cloth polish, which has here-to-fore been the last given by opticians to Lenses of small diameter, they are again polished on a pitch surface in the same careful manner as the best telescope object glasses of late years have been finished.

This pitch polish accounts for the beautiful stereoscopic effect and brilliancy noticeable in pictures made by Francais Lenses.

THIRDLY—

They are larger in diameter than Lenses by other makers of equal focus, covering the same sized plate. This gives room for more perfect correction of the spherical aberration than is possible with Lenses of smaller diameter and at the same time allows the admission of an additional number of light rays, consequently greatly increasing their value as Portrait and Instantaneous Objectives.

For Group, Architectural and Landscape work, the two unquestionably excelling qualities of our Francais Lenses: Depth of Focus and great rapidity cannot be too highly spoken of or their true value to the Photographer over-estimated.

Whilst in the two very essential qualities of an objective namely—flatness of field and and perfect rectilinearity, they will be found, at least, equal to any Lense now in the market.

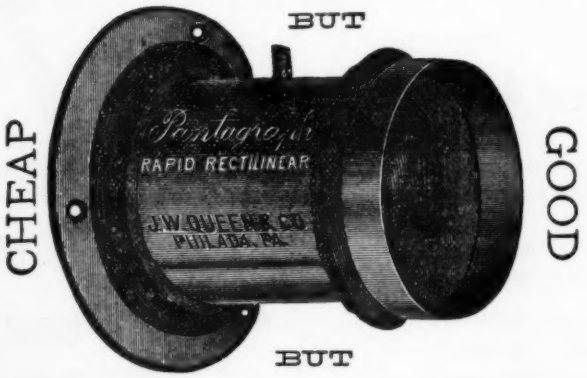
SEEING IS BELIEVING.

Buy them with the privilege of returning them to us undamaged, C. O. D. for the full amount paid, at any time within thirty days of purchase, if not found absolutely satisfactory in every respect.

Circular mailed on receipt of application by any dealer in Photographic supplies,

JAMES W. QUEEN & CO., Opticians, Philadelphia, Penna.

QUEEN & CO.'S
PANTAGRAPH RAPID RECTILINEAR LENSES.



The Pantagraph Rectilinear Lenses possess many valuable properties peculiar to themselves. They are perfectly rectilinear, and work well with the largest diaphrams for groups and instantaneous views. Their great compactness and lightness are a boom to the out-door artist, while their flatness of field and their penetrating power, in which, from carefully made tests, they are equal to many of the noted lenses in the market, render them very valuable for landscapes and copying work of every discription.

For those to whom the price of our Francaise Lenses would be an obstacle, The Pantagraph Lenses will be found especially satisfactory.

PRICE-LIST OF QUEEN & CO.'S
Pantagraph Rapid Rectilinear Lenses.

Catalogue No.	Size of Plate.	Diameter of Lens.	Back Focus.	Equivalent Focus.	Extreme Angle	Price.
P-41.	3¼ x4¼ ins.	⅜ ins.	4 ins.	4⅞ ins.	80°	$ 10 00
P-42.	4 x5 ins.	1 1-16 ins.	5 ins.	5¾ ins.	78°	12 00
P-43.	5 x8 ins.	1 5-16 ins.	8 ins.	8¼ ins.	66°	15 00
P-44.	6½x8½ ins.	1¾ ins.	10¼ ins.	11 ins.	66°	24 00
P-45.	8 x10 ins.	2⅛ ins.	13 ins.	13¾ ins.	66°	30 00
P-46.	10 x12 ins.	2½ ins.	15 ins.	16 ins.	66°	36 00
P-47.	12 x15 ins.	2¾ ins.	20½ ins.	22 ins.	66°	42 00
P-48.	17 x20 ins.	3¼ ins.	25 ins.	27½ ins.	66°	60 00
P-49.	20 x24 ins.	3¾ ins.	28½ ins.	31 ins.	66°	100 00

Nos. 1 and 2 furnished in matched pairs for stereoscopic work.

FOR SALE BY ALL DEALERS.

Try them before deciding on any other make.

Solar and Electric Prints

Rain or Shine.

NO LONG DELAY ON ACCOUNT OF DULL WEATHER.

PRICE LIST OF

PERMANENT PHOTOGRAPHIC ENLARGEMENTS.

Size.	Unmounted.	Mounted.
8 x 10	$ 50	$ 60
10 x 12	80	1 00
11 x 14	1 00	1 25
14 x 17	1 35	1 75
16 x 20	1 50	1 85
18 x 22	1 75	2 25
20 x 24	2 00	2 50
22 x 27	2 40	2 85
25 x 30	2 75	3 40

Size.	Unmounted	Mounted.
26 x 32	$ 3 00	$ 3 65
29 x 36	4 00	4 70
30 x 40	5 00	5 75
35 x 45	6 00	7 25
40 x 50	8 00	10 75
45 x 60	9 25	12 50
50 x 70	13 00	17 00
52 x 80	17 50	22 50

No Charge for making Negatives.

Thos. H. McCollin & Co.,

Manufacturers, Importers and Dealers in

Photographers' Supplies,

No. 635 Arch Street,

PHILADELPHIA.


H
Harvard
DRY PLATE
RAPID, CLEAN, CLEAR & BRILLIANT.
EASY MANIPULATION,
FREEDOM FROM FRILLING,
STRUCTURELESS FILM.
HARVARD DRY PLATE CO.
MAIN 25 STREET,
CAMBRIDGE,
MASS.

The glow-worms pale their ineffectual fires before the brilliant light of

BLITZ-PULVER

The $50.00 Gold Prize for best Blitz-Pulver Photographs was won by Mr. L. C. Overpeck, of Hamilton, Ohio, for large portraits.

August 17th, 1888.

MESSRS. THOS. H. MCCOLLIN & CO.,
Philadelphia, Pa.

GENTLEMEN,

It is with pleasure that I recommend your Blitz-Pulver as *the compound* for flash-light photography, to all who wish to make a success of it.

I am very sorry to see so many worthless compounds being put on the market; this, I think, has stayed the progress of flash-light photography *very much*, so many photographers being unfortunate in getting the inferior and utterly worthless compounds of magnesuim, and, consequently, making a failure, not knowing the cause thereof. To all those I would say, Get the "Blitz," use it properly, and you will know no failures.

Very respectfully,
L. C. OVERPECK.

McCollin & Co.'s Blitz-Pulver.

Ferris Bros., Printers, S. W. Cor. Sixth and Arch Sts., Philadelphia.

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OCTOBER, 1888.

CONTENTS OF THIS NUMBER.

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